



VAISALA

MMP8 Moisture in Oil Probe



Features

- Continuous online measurement of moisture in oil and temperature
- Temperature measurement range $-40 \dots +180^\circ\text{C}$ ($-40 \dots +356^\circ\text{F}$)
- Measurement accuracy up to $\pm 0.01 a_w$ ($\pm 1\%RS$)
- Incorporates the proven Vaisala HUMICAP® sensor
- Modbus® RTU over RS-485
- Two lengths available for the probe head: 262 mm and 448 mm
- Traceable calibration certificate
- Compatible with Vaisala Indigo products and Insight PC software

Vaisala HUMICAP® Moisture in Oil Probe MMP8 enables fast and reliable measurement of moisture in oil. It uses the proven Vaisala HUMICAP® sensor, which was developed for demanding dissolved moisture measurements in transformer and lubrication oils, hydraulic fluids, and other liquids.

Reliable Vaisala HUMICAP® technology

MMP8 incorporates the latest-generation Vaisala HUMICAP® 180L2 sensor, which is the result of over 20 years of field experience.

The 180L2 sensor's excellent chemical tolerance provides accurate and reliable measurement over a wide measurement range. The sensor has excellent sensitivity in the dry end of the range, which is typically needed in transformer applications.

Measure the margin to water saturation

MMP8 measures dissolved moisture in oil in terms of water activity (a_w), relative saturation (%RS), and temperature (T). Water activity or relative saturation

indicate directly whether there is a risk of free water formation. This data is relevant in lubrication oil applications where detecting water ingress and preventing free water formation is crucial. The measurement is independent of oil type and age.

MMP8 can also output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily available for specific oils, including mineral transformer oil. This allows continuous measurement of ppm concentration in power transformer condition monitoring.

For other oils, the oil-specific conversion coefficients can be calculated if the water solubility of the oil is known and the solubility characteristic remains constant.

Easy installation

When installed with an optional ball valve kit, MMP8 is ideal for installation into processes where the probe needs to be installed or removed while the process is running. MMP8 is available in two different lengths, and the installation depth of the probe is adjustable. Pressure fitting options are ISO 1/2" and NPT 1/2". MMP8 is delivered with a manual pressing handle that allows the probe to be pushed against process pressure.

For more information on Indigo family products and Insight PC software that can be used with the probe, see www.vaisala.com/insight and www.vaisala.com/indigo.

Technical data

Measurement performance

Water activity

Measurement range 0-1 a_w

T_{90} response time¹⁾ 10 min

Sensor HUMICAP® 180L2

Accuracy²⁾ $\pm 0.01 a_w$ ($\pm 1\%$ RS)

Water concentration in oil

Typical accuracy 10 % of the reading

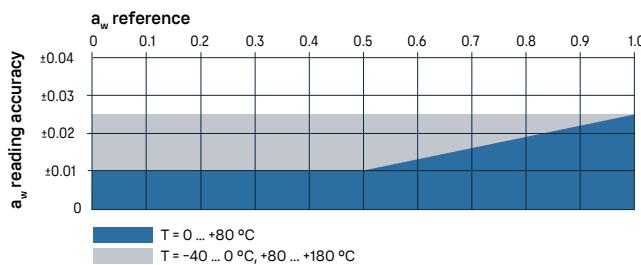
Temperature

Measurement range -40 ... +180 °C (-40 ... +356 °F)

Accuracy at +20 °C (+68 °F) ± 0.2 °C (0.36 °F)

1) At +20 °C (+68 °F) in still oil.

2) In range 0-0.5 a_w , including non-linearity, hysteresis, and repeatability. See accuracy graph below.



Operating environment

Operating temperature of probe head -40 ... +180 °C (-40 ... +356 °F)

Operating temperature of probe body -40 ... +80 °C (-40 ... +176 °F)

Storage temperature range -40 ... +80 °C (-40 ... +176 °F)

Operating pressure range 0-40 bar (0-580 psi), absolute

Installation pressure Up to 10 bar (145 psi), absolute

IP rating of probe body IP66

Ball valve

Operating temperature Up to +100 °C (+212 °F)

Operating pressure Up to 40 bar (580 psi), absolute

Inputs and outputs

Operating voltage 15-30 V DC

Current consumption 10 mA typical

Digital output RS-485, non-isolated

Protocols Modbus RTU

Output parameters
Relative saturation (%RS)
Temperature (°C)
Water activity
Water concentration in oil (ppm_w)

Mechanical specifications

Connector

M12 5-pin A-coded male

Weight (with a 2-m cable)

262-mm-long MMP8: 510 g (18.0 oz)

448-mm-long MMP8: 610 g (21.5 oz)

Filter options

Stainless steel grid standard filter

Stainless steel grid filter for high flow rates (> 1 m/s)

Probe cable length

2 m (6.56 ft)

Adjustable installation depth

262-mm-long MMP8: 35-193 mm (1.37-7.59 in)

448-mm-long MMP8: 35-379 mm (1.37-14.92 in)

Materials

Probe

AISI 316L

Probe body

AISI 316L

Cable jacket

FEP

Compliance

EU directives and regulations

EMC Directive (2014/30/EU)
RoHS Directive (2011/65/EU) as amended by 2015/863

Electromagnetic compatibility (EMC)

EN 61326-1, industrial environment

Compliance marks

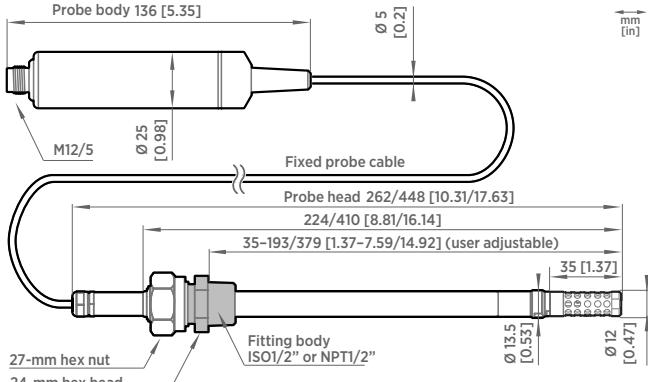
CE, China RoHS, RCM

Type approvals

DNV GL certificate no. TAA00002YT¹⁾



1) DNV GL certificate applies to the 262-mm-long MMP8 model only, not to the 448-mm-long model.



MMP8 dimensions

Accessories

Ball valve kit ISO 1/2" with welding joint BALLVALVE-1

Ball valve kit ISO 1/2" - ISO 3/4" with thread joint BALLVALVE-2

Indigo USB adapter¹⁾ USB2

Calibration adapter for HMK15 211302SP

Weatherproof carrying case for Indigo80 and a series 8 probe²⁾ ASM215318

1) Vaisala Insight software for Windows available at www.vaisala.com/insight.

2) For example, MMP8, HMP8, or DMP8 with a max. 2-m (6.6-ft) probe connection cable.